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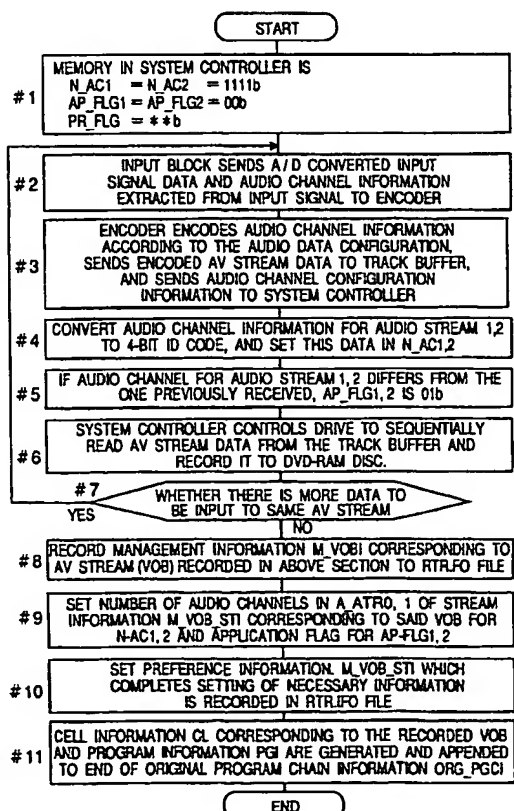
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(54) Title: OPTICAL DISC, RECORDING DEVICE AND REPRODUCING DEVICE



(57) Abstract: Optical discs formatted to record plural audio streams of different content for reproduction with a single video stream can result in audio output of content unexpected by the user depending upon the audio stream configuration contained in the AV stream reproduced. This can confuse and cause the user to change the audio output after reproduction starts. To prevent this, information indicating the type of audio stream configuration contained in each AV stream on the optical disc is stored with each audio stream. This audio stream type information is presented to the user on the same screen from which an AV program is selected for playback. The user can thus know before playback starts what audio stream channel is preselected for playback, and can change the audio channel as desired before playback starts.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

AMENDED CLAIMS

[received by the International Bureau on 3 October 2000 (03.10.00);
original claims 1-7 replaced by new claims 1-10 (7 pages)]

1. An optical disc comprising:
- an area for storing an AV stream containing an encoded
5 video stream and at least one encoded audio stream, and
- an area for storing management information,
- said management information comprising an
application flag which indicates whether a single audio stream
includes at least two of the following, and
- 10 (a) dual monaural audio data having first
audio channel data and second audio channel data, one of
which is selectively reproduced,
- (b) stereo audio data having first audio
channel data and second audio channel data, which are
15 simultaneously reproduced, and
- (c) monaural audio data having data for
only one audio channel.
2. An optical disc as claimed in claim 1, wherein said
20 management information further comprising, when the single
audio stream contains at least two of said audio data (a), (b)
and (c), data indicating which one of the at least two audio
data (a), (b) and (c) is a representative audio data.

3. A recording method for recording an optical disc comprising an area for storing an AV stream containing an encoded video stream and at least one encoded audio stream, and an area for storing management information, said recording method comprising:

detecting whether a single audio stream comprises at least two of the following,

(a) dual monaural audio data having first audio channel data and second audio channel data, one of which is selectively reproduced,

(b) stereo audio data having first audio channel data and second audio channel data, which are simultaneously reproduced, and

(c) monaural audio data having data for only one audio channel; and

recording an application flag to the area for storing management information according to the detection result.

20

4. A recording method as claimed in claim 3, further comprising:

determining a representative audio data when the

single audio stream contains at least two of said audio data (a),
(b) and (c); and

recording the representative audio data to said
area for storing management information.

5

5. A recording apparatus for recording an optical
disc comprising an area for storing an AV stream containing an
encoded video stream and at least one encoded audio stream,
and an area for storing management information, said

10 recording apparatus comprising:

detection means for detecting whether a single
audio stream comprises at least two of the following,

(a) dual monaural audio data having first
audio channel data and second audio channel data, one of
15 which is selectively reproduced,

(b) stereo audio data having first audio
channel data and second audio channel data, which are
simultaneously reproduced, and

(c) monaural audio data having data for
20 only one audio channel; and

recording means for recording an application flag
to the area for storing management information according to
the detection result.

6. A recording apparatus as claimed in claim 5, further comprising:

means for determining a representative audio data
5 when the single audio stream contains at least two of said audio data (a), (b) and (c); and

recording means for recording the representative audio data to said area for storing management information.

10 7. A playback method for reproducing an optical disc comprising an area for storing an AV stream containing an encoded video stream and at least one encoded audio stream, and an area for storing management information, said management information comprising an application flag which
15 indicates whether a single audio stream includes at least two of the following,

(a) dual monaural audio data having first audio channel data and second audio channel data, one of which is selectively reproduced,

20 (b) stereo audio data having first audio channel data and second audio channel data, which are simultaneously reproduced, and

(c) monaural audio data having data for

only one audio channel;

the playback method comprising:

reading the application flag from the area for
storing management information;

5 detecting according to the application flag
whether the single audio stream contains at least two of said
audio data (a), (b) and (c).

8. A playback method as claimed in claim 7,

10 wherein said management information further
comprising, when the single audio stream contains at least two
of said audio data (a), (b) and (c), data indicating which one of
the at least two audio data (a), (b) and (c) is a representative
audio data, and

15 said playback method further comprising reading
from the area for storing management information, when the
single audio stream contains at least two of said audio data (a),
(b) and (c), the data indicating which one of the at least two
audio data (a), (b) and (c) is the representative audio data.

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9. A playback apparatus for reproducing an optical
disc comprising an area for storing an AV stream containing an
encoded video stream and at least one encoded audio stream,

and an area for storing management information, said management information comprising an application flag which indicates whether a single audio stream includes at least two of the following,

5 (a) dual monaural audio data having first audio channel data and second audio channel data, one of which is selectively reproduced,

(b) stereo audio data having first audio channel data and second audio channel data, which are
10 simultaneously reproduced, and

(c) monaural audio data having data for only one audio channel;

the playback apparatus comprising:

means for reading the application flag from the
15 area for storing management information;

means for detecting according to the application flag whether the single audio stream contains at least two of said audio data (a), (b) and (c).

20 10. A playback apparatus as claimed in claim 9, wherein said management information further comprising, when the single audio stream contains at least two of said audio data (a), (b) and (c), data indicating which one of

the at least two audio data (a), (b) and (c) is a representative audio data, and

said playback apparatus further comprising means for reading from the area for storing management information, 5 when the single audio stream contains at least two of said audio data (a), (b) and (c), the data indicating which one of the at least two audio data (a), (b) and (c) is the representative audio data.

STATEMENT UNDER ARTICLE 19

The claims are amended according to the corresponding EP
5 application as explained below.

The present PCT application does not have EPC as one of
the designated states, because the EP application (No. **00 106**
798.2-2210) has been filed separately.

Claim 1 relates to an optical disc in accordance with the
10 present invention. One feature of the present invention recited in
claim 1 is in that:

"management information comprising an application flag
which indicates whether a single audio stream includes at
least two of the following, (a) dual monaural audio data
15 having first audio channel data and second audio channel
data, one of which is selectively reproduced, (b) stereo
audio data having first audio channel data and second
audio channel data, which are simultaneously reproduced,
and (c) monaural audio data having data for only one audio
20 channel."

The above feature is disclosed on page 39, line 12 and lines
14-18 of the original specification.

One of advantages of claim 1 in accordance with the present
invention is to avoid the user from being confused when playback
25 actually begins.

Claim 3 relates to a recording method, and corresponds to

claim 1.

Claim 5 relates to a recording apparatus, and corresponds to claim 1.

Claim 7 relates to a playback method, and corresponds to
5 claim 1.

Claim 9 relates to a playback apparatus, and corresponds to claim 1.

Claims 2, 4, 6, 8 and 10 relates to data indicating which one of the at least two audio data (a), (b) and (c) is a representative
10 audio data. This is disclosed in the specification on page 43, lines 1-10.